

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments, see Remarks, filed 7/24/2009, with respect to claims 1-9, 11-14, 16-19, 20-23, 26, 28, 36 and 37 have been fully considered but they are not persuasive.

The applicant argues that the rejection to claim 1 is improper since the prior art requires a step of contacting the nitrate solution with an amide reagent to reduce the nitrites to nitrogen and carbon dioxide or acid anion. The applicant states that the prior art requires contact with a second metal that is not required in the instant application. The applicant argues that the Dziewinski reference also converts nitrates to non-pollutant species in two steps in contrast to claimed invention, which converts it in a single step. The Examiner notes the term "comprising" which is synonymous with "including" "containing" or "characterized by" is inclusive or open ended and does not exclude additional unrecited elements or method steps. MPEP 2111.03

The applicant also argues that the prior art does not disclose that the pH range of the claimed liquid medium is less than 4. The attorney argues the MPEP 2131.03 directed to a narrow range. In accordance with the MPEP, the Examiner has added the 102/103 rejection below.

Applicant's arguments filed 7/24/2009 with regards to claims 29, 30, 33, 34, 35, 38, 40, 41, 44, and 46 have been fully considered but they are not persuasive. The applicant argues that the limitation of "liquid medium loaded with nitrates and with a pH is less than 4" in claim 29 is not met. The Examiner notes the limitation is in the

Art Unit: 1797

preamble and has not been given patentable weight. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

***Claim Rejections - 35 USC § 102/103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 1797

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-3, 5-9, 12, 13, 18, 19, 22, 23, 27, 29, 33, 41, and 46 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Dziewinski et al US 6,030,520.

Regarding claim 1, Dziewinski discloses a method for chemically treating a liquid medium loaded with nitrates, comprising contacting zinc with said liquid medium, but possibly does not disclose wherein the liquid medium has a pH less than 4. The reference does state that the pH at the start of the process can range from about 0 to 8 depending on the concentration of the nitrate. (Column 3 line 5-6)(Column 4 line 47-48) It would have been obvious to one of ordinary skill in the art at the time of the invention to use a liquid medium in the range of 0-8 such as 4, since the Dziewinski reference discloses that a pH of 4 is in the effective range of the process. The Examiner notes that the anticipation rejection is based on the disclosure of a narrow range of values (0-8) wherein the instant claims' value of less than 4 covers half of the total range listed. The Examiner also notes that the total range for pH is 0-14 and the prior art is thought to narrow the range to a specific narrow range.

Regarding claim 2, Dziewinski discloses a the method according to claim 1, further comprising maintaining the pH of said liquid medium by a regular adjustment with the addition of acid to the liquid medium. (Column 4 line 43-44)

Art Unit: 1797

Regarding claim 3, Dziewinski discloses the method according to claim 2, wherein the acid is hydrochloric acid. (Column 6 line 30-31)

Regarding claim 5, Dziewinski discloses the method according to claim 1, wherein the temperature liquid medium has a temperature greater than 20°C during contacting. (Column 6 line 66-67) The Examiner interprets 20 degree C to be ambient temperature.

Regarding claim 6, Dziewinski discloses the method according to claim 1, wherein the temperature of the liquid medium has a temperature of approximately 20°C. (Column 6 line 66-67)

Regarding claim 7, Dziewinski discloses the method according to claim 1, wherein the zinc is in the form of a powder. (Column 3 line 65)

Regarding claim 8, Dziewinski discloses the method according to claim 7, herein the zinc and the nitrates in solution have a weight ratio of at least 5. (Column 3 line 42)

Regarding claim 9, Dziewinski discloses the method according to claim 7 wherein the liquid medium is stirred. (Column 3 line 67)

Regarding claim 12, Dziewinski discloses the method according to claim 1 wherein the liquid medium has an initial concentration of nitrates greater than 25 mg/L. (Column 3 line 2)

Regarding claim 13, Dziewinski discloses the method according to claim 1, wherein the liquid medium has an initial concentration of nitrates greater than 50 mg/L. (Column 3 line 2)

Regarding claim 18, Dziewinski discloses the method according to claim 1,

Art Unit: 1797

wherein the liquid medium is drainage water. (Column 2 line 51) The Examiner interprets Agricultural waste streams to include drainage water.

Regarding claim 19, Dziewinski discloses the method according to claim 18, wherein the drainage water has a concentration of nitrates greater than 1 g/L. (Column 3 line 2)

Regarding claim 22, Dziewinski discloses the method according to claim 1, comprising treating the liquid medium by electrolysis. (Column 8 line 38)

Regarding claim 23, Dziewinski discloses the method according to claim 22, wherein the electrolysis causes the liquid medium to circulate in at least one electrolysis cell in which a current circulates between, an anodic electrode and a cathodic electrode. (Column 5 lines 48-50)

Regarding claim 27, Dziewinski discloses the method according claim 22 further comprising maintaining a pH of the liquid medium above 5 during the entire electrolysis step. (Column 4 lines 45-48)

Regarding claim 29, Dziewinski discloses the device capable of chemically treating a liquid medium loaded with nitrates and with a pH is less than 4 comprising: at least one liquid nitrate reduction enclosure (Column 5 lines 22-27), which comprises a liquid inlet (Column 5 line 22) The examiner interprets continuous to have an inlet and outlet, at least one zinc layer (Column 3 line 6), a means for the circulation of said liquid medium, through said zinc layer (Column 5 line 23), and a liquid medium outlet of the enclosure (Column 7 line 31) (Column 5 line 22) The examiner interprets continuous to have an inlet and outlet.

Regarding claim 33, Dziewinski discloses the device according to claim 29 wherein the enclosure comprises a system for stirring the liquid capable of stirring the liquid circulating in the enclosure above each zinc layer by forming a corresponding stirring zone. (Column 5 line 25)

Regarding claim 40, Dziewinski discloses the device according claim 29 comprising a zinc reduction enclosure in which the liquid circulates at the outlet of the nitrate reduction enclosure. (Column 5 lines 38-51)

Regarding claim 41, Dziewinski discloses the device according to claim 40, wherein the zinc reduction enclosure comprises at least one electrolysis cell. (Column 5 line 49)

Regarding claim 46, Dziewinski discloses the device according to claim 40, comprising a pH regulator that it maintains the liquid medium circulating in the zinc reduction enclosure at a pH above 7. (Column 4 lines 45-48)

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 29, 33, 40, 41 and 46 are rejected under 35 U.S.C. 102(b) as being anticipated by Dziewinski US 6,030,520.

Regarding claim 29, Dziewinski discloses the device capable of chemically treating a liquid medium loaded with nitrates and with a pH is less than 4 comprising: at least one liquid nitrate reduction enclosure (Column 5 lines 22-27), which comprises a liquid inlet (Column 5 line 22) The examiner interprets continuous to have an inlet and outlet, at least one zinc layer (Column 3 line 6 ), a means for the circulation of said liquid medium, through said zinc layer (Column 5 line 23), and a liquid medium outlet of the enclosure (Column 7 line 31) (Column 5 line 22) The examiner interprets continuous to have an inlet and outlet.

Regarding claim 33, Dziewinski discloses the device according to claim 29 wherein the enclosure comprises a system for stirring the liquid capable of stirring the liquid circulating in the enclosure above each zinc layer by forming a corresponding stirring zone. (Column 5 line 25)

Regarding claim 40, Dziewinski discloses the device according claim 29 comprising a zinc reduction enclosure in which the liquid circulates at the outlet of the nitrate reduction enclosure. (Column 5 lines 38-51)

Regarding claim 41, Dziewinski discloses the device according to claim 40, wherein the zinc reduction enclosure comprises at least one electrolysis cell. (Column 5 line 49)

Regarding claim 46, Dziewinski discloses the device according to claim 40, comprising a pH regulator that maintains the liquid medium circulating in the zinc reduction enclosure at a pH above 7. (Column 4 lines 45-48)

Claims 29 and 30 are rejected under 35 U.S.C. 102(b) as being anticipated by Heskett US 5,951,869.

Regarding claim 29, Heskett discloses the device capable of chemically treating a liquid medium loaded with nitrates and with a pH of less than 4 comprising:  
at least one liquid nitrate reduction enclosure (Column 7 line 37), which comprises a liquid inlet(Column 8 line 1)  
at least one zinc layer(Column 14 line 6 Abstract), a means for the circulation of said liquid medium, through said zinc layer (Column 17 line 24-29), and a liquid medium outlet of the enclosure (Column 7 line 31)

Regarding claim 30, Heskett discloses the device according to claim 29, further comprising at least one pH regulator capable of maintaining the liquid medium at a pH of less than 4. (Column 4 lines 21-30)

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 34, 38, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Dziewinski as applied above.



Art Unit: 1797

Regarding claim 34, Dziewinski discloses the device according to claim 33, but does not disclose wherein the liquid in each stirring zone has a stirring speed of 0.85 m/s. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a stirring speed of 0.85 m/s, since it has been held that where the general condition exist in the prior art, it is within the ordinary skill of one in the art to find or discover the optimum or workable ranges.

Regarding claim 38, Dziewinski discloses the device according to claim 29 wherein the liquid in the enclosure has a circulation speed of approximately 0.01 m/s. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a stirring speed of 0.01 m/s, since it has been held that where the general condition exist in the prior art, it is within the ordinary skill of one in the art to find or discover the optimum or workable ranges.

Regarding claim 44, Dziewinski discloses the device according to claim 41, wherein the zinc reduction enclosure comprises at least three electrolysis cells. It would have been obvious to one of ordinary skill in the art at the time of the invention to use three electrolysis cells, since it has been held that mere duplication of parts is within the ordinary skill of one in the art, and one would expect to receive the added benefit of increased treatment.

Claim 35 is rejected under 35 U.S.C. 103(a) as being unpatentable over Dziewinski as applied above in claim 33 in further view of Heskett US 5,951,869.

Art Unit: 1797

Regarding claim 35, Dziewinski discloses the device according to claim 33 but does not disclose wherein at least one stirring zone out of two is connected to a pH regulator. It does disclose the use of pH adjustment/regulation is performed as necessary. Heskett does disclose the use of a pH regulator at the inlet for use in treating nitrate solutions. (Column 4 line 20-27) It would have been obvious to one of ordinary skill in the to locate the pH regulation means in conjunction with at least one stirring zone, since Heskett discloses this arrangement yields the added benefit of being more responsive.

#### ***Allowable Subject Matter***

Claims 15, 24, 25, 31, 32, 36, 37, 39, 42, 43, 45, and 49 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: The prior art does not appear to disclose the use of compressed zinc chips between to perforated plates or degreasing and rinsing of the chips or that the zinc layer has a height less than 10cm. The prior art also does not disclose a pH of 10.

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CAMERON J. ALLEN whose telephone number is (571)270-3164. The examiner can normally be reached on M-Th 9-7pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

CJA

/Walter D. Griffin/  
Supervisory Patent Examiner, Art Unit 1797